1.0 Introduction

In 2005, the U.S. Army Alaska (USARAK) and United States Army Garrison, Alaska (USAG-AK) undertook the development of several proposed projects which triggered an archaeological and cultural resources analysis of proposed areas of potential effect. This report details the archaeological review and analysis which was conducted for each undertaking, on lands at Donnelly Training Area, Fort Wainwright (Figure 1). The survey was conducted by the USAG-AK and the Center for Environmental Management of Military Lands (CEMML, Colorado State University).

Survey and sub-surface testing were conducted following procedures defined in USAG-AK archaeological methodology (Raymond-Yakoubian and Robertson 2005a) and Integrated Cultural Resources Management Plan (ICRMP; Office of History and Archaeology 2001). Where archaeological sites were identified within a project's area of potential effect (APE), evaluative testing was conducted to determine eligibility for listing in the National Register of Historic Places (NRHP), based on National Register Criteria detailed in 36 CFR 79, and pursuant to Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR 800).

Archaeological field crews, comprised of employees of the CEMML, Colorado State University, conducted surveys of areas potentially impacted (both directly and indirectly) by proposed undertakings and conducted the testing to determine eligibility for listing in the NRHP. Five archaeological survey crews, each consisting of four archaeologists, conducted the work in the DTA.

1.2 Setting

The Donnelly Training Area (DTA) is located in central Alaska, north of the Alaska Range in the Tanana River valley. The Post lies 120 miles south of the Arctic Circle near the city of Delta Junction. The DTA consists of the West and East Training Areas and three outlying training sites: Gerstle River Training Area, Black Rapids Training Area and Whistler Creek Rock Climbing Area. For the purposes of this report, only the DTA East and West are discussed. The DTA West is an 894 square-mile parcel bounded by the Delta River to the east and the Little Delta River to the west. It covers approximately 571,995 acres. The East Training Area is an 81 square-mile parcel stretching east of the Delta River to Granite Creek. It covers approximately 51,590 acres.

The DTA has the northern continental climate of interior Alaska, which is characterized by short, moderate summers, long, cold winters and low precipitation and humidity. Weather is influenced by mountain ranges on three sides that form an effective barrier to the flow of warm, moist maritime air during most of the year. Surrounding upland areas tend to aid drainage and the settling of cold arctic air into the Tanana Valley lowlands (Natural Resources Branch 2001).

The Alaska Meteorological Team (AMT) at the Central Meteorological Observatory, Fort Greely and Donnelly Training Area, monitors weather at the post. Average monthly temperatures range from -6.4ºF in January to 60.0ºF in July, with an average annual temperature of 27.4ºF. The record low temperature is -63ºF, and the record high is 92ºF. The average frost-free period is 95-100 days (based on 27 years of AMT data).

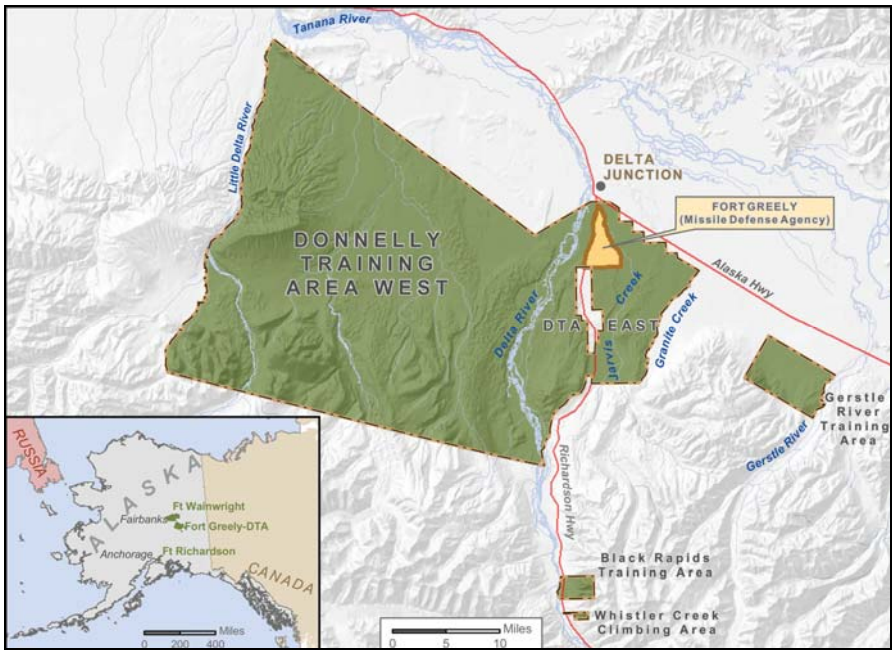

Figure 1. Location of Fort Wainwright's Donnelly Training Area

Prevailing winds are from the east-southeast from September through March and from the west, southwest, or south from April through August. Average wind velocity is 8.2 miles per hour (mph). The greatest wind speeds occur during winter, with a high of 104 mph recorded in the month of February. Winds are 5 mph or less only 13.6 percent of the time and wind speeds greater than 60 mph have been recorded in every month. Thunderstorms are infrequent and occur only during summer (based on 20 years of AMT data) (Natural Resources Branch 2001).

Average annual precipitation is 11.12 inches, which falls over 90.4 days, mostly during summer and early fall. Average monthly precipitation ranges from a low of 0.24 inches in April to a high of 2.38 inches in June. Average annual snowfall is 40.5 inches, with a record 99.7 inches in 1945 (based on 27 years of AMT data) (Natural Resources Branch 2001).

2.0 Literature Review

2.1 History

The DTA lands fall within an area occupied at the time of Euro-American contact by Lower-Middle Tanana Athabascans (Andrews 1975:177; McKennan 1981:564; Mishler 1986). Traditional settlement patterns were focused on a widely mobile seasonal round, with the fall caribou hunt playing a pivotal role in subsistence preparations for the winter, while summer activities were focused at fish camps and in berry and root collecting and sheep hunting (McKennan 1981:565). These activities frequently had a communal focus, with several local 'bands' connected by common interest, geography and intermarriage. Despite anthropological attempts to define 'boundaries' for the peoples living in the lower Tanana River valley, natural terrain served as the only definable 'boundary' to settlement patterns (McKennan 1981).

As Euro-American traders, miners, missionaries and explorers moved into the Tanana River valley, the traditional lifestyles of local Athabascan groups were disrupted. Access to trade goods and the development of the fur trade not only affected traditional material culture, but also began to dramatically affect subsistence activities and settlement patterns. Similarly, the advent of missionaries in the Interior of Alaska profoundly affected traditional social organization. The introduction of mission schools for Native children and the doctrine of new religious beliefs contributed to an erosion of traditional settlement patterns and practices (McKennan 1981).

In 1898, the discovery of gold in the Tanana uplands began a rush of Euro-American settlement into the Tanana River valley. As the economic importance of the Tanana Valley increased, the need for reliable transportation routes and communication systems rose in tandem. Existing trails, such as the Bonnifield, Donnelly-Washburn and Valdez-Fairbanks trails saw increased use and development in the first decade of the 20th century. This increase in activity also resulted in the establishment of several roadhouses and posts. In 1906 Congressional appropriations led to improvement of the Valdez-Fairbanks trail, crossing the Alaska Range south of Delta Junction, following the Tanana River to Fairbanks. Completion of the Alaska Railroad in 1923 was followed two decades later by construction of the Alaska Highway in 1942, firmly tying the Alaskan interior to the outside.

Development in the Alaskan interior increased dramatically with the advent of World War II and the subsequent military build-up in Alaska. Of particular significance was the development of airfields near Delta Junction (Fort Greely), Fairbanks (Ladd Field, later Fort Wainwright), and 26 miles southeast of Fairbanks (Eielson Air Force Base). These locations began as lend-lease bases and cold weather testing centers, but soon expanded with the increased need for military support during World War II and later, the Cold War.

2.2 Prehistory

As noted by John F. Hoffecker (1996), Beringian archaeology is in an early phase of development, with archaeologists on both sides of the Bering Strait still working on the construction of cultural chronologies. That being said, it should come as no surprise that there is a lot of debate involved in the creation of a prehistoric chronology for Interior Alaska. This section offers a brief comparison of two different views on the chronology: the chronology present in Alaskan archaeology in some form since the 1960s that has been modified over the years and one proposed by eminent Alaskan archaeologist Charles Holmes in the mid-1990s.

Traditional chronologies of Alaskan prehistory divide time into periods based on tool forms. The broadest classification divides Alaskan prehistory into three traditions: the American Paleoarctic

Tradition, the Northern Archaic Tradition and the Athapaskan Tradition. Because of the almost continuous flux involved with the many subcategories of an Alaskan prehistory, this section will discuss the broadest classification.

- The American Paleoarctic Tradition (12,000-6,000 BP). This tradition includes the Denali Complex, originally defined by West (1967) includes distinctive microblade cores, core tablets and their derivative microblades, large blades, biconvex bifacial knives, certain end-scraper forms, and burins. West (1981) later stated the Denali Complex is a regional variant of the American Paleoarctic Tradition defined by Anderson (1970). Also included within this Tradition is the Chindadn, so-named by Cook (1969) from the Athapaskan word for "ancestor", Complex. The Chindadn Complex is also called the Nenana Complex. The defining characteristic of the Chindadn Complex is the presence of Chindadn points—bifacially flaked triangular or tear dropped shaped projectile points. Scholars have at times (e.g. Dixon 1999) situated the Nenana Complex before the American Paleoarctic Tradition in terms of chronology. However, there is some debate as to whether or not the Chindadn Complex definitely predates the Denali Complex, so for simplicity's sake they are both included in the American Paleoarctic Tradition.

- The Northern Archaic Tradition (6,000-2,000 BP). The hallmark of the Northern Archaic Tradition is the presence of side-notched points (Anderson 1968b). There are generalized resemblances between this tradition and the Archaic cultures of the Great Plains of the lower 48 states, although it is uncertain that any of the Northern Archaic traits, other than most likely the side-notched points, originated outside of the western subarctic region (Clark 1992). Anderson (1968) correlated the advent of Northern Archaic technologies with the full establishment of the taiga forest, comparing these technologies to those of the forest-oriented Archaic cultures of the lower 48 states.

- The Athapaskan Tradition (2,000 BP-1880 AD). The Athapaskan Tradition includes cultures generally believed to be the ancestors of the Athapaskan tribes who occupy Interior Alaska today. The Athapaskan Tradition includes a reorganization of raw materials, which de-emphasized stone tool making and increased the emphasis on the manufacture of items from native copper and organic materials (Dixon 1985).

An intermediary period known as the Late Denali Complex was once suggested (e.g. Dixon 1985) as taking place after the Northern Archaic Tradition, during which microblades reappeared. However, it is now generally accepted that the Northern Archaic Tradition includes microblade technology.

Holmes (1995, 2001) has proposed an alternative chronology for the Tanana valley. Holmes avoids some of the complications of earlier attempts to create a chronology, in that he does not focus solely on artifact form. Instead, the time periods he suggests are arranged chronologically and "divided according to environmental and cultural criteria" (Holmes 2001:156). These periods are: the Beringian Period, the Transitional Period, the Early Taiga Period, the Late Taiga Period and the Athapaskan Period (Holmes 1995). Holmes' periods encompass the traditional typologies and situate them within an environmental framework to create a chronology for Interior Alaskan prehistory.

- During the Beringian Period, defined as greater than 11,000 years BP, there was still a land connection between Alaska and Siberia, and as of yet no boreal forest in Beringia. Some artifact assemblages from this period lack microblades; others have them. This difference may be attributable to differences in site environment,

function, or seasonality. Holmes proposes the term "East Beringian Complex" to describe these earliest assemblages.

- The Transitional Period, occurring from 11,000 to 8,500 yr. BP, is marked by major environmental changes: the land connection to Siberia disappears, animals become extinct, substantial climatic changes occur, and forestation begins. By around 9,000 BP, spruce-birch forest had replaced the shrub tundra.
- The Early Taiga period, 8,500 to 5,000 BP, marks the full establishment of the boreal forest. During this period, the American Paleoarctic Tradition gives way to the Northern Archaic Tradition.
- The Middle Taiga period, from 5,000 to ca. 2,500 yr. BP, sees a continuation of the artifact types of the Northern Archaic Tradition, which include microblades and burins.
- The Late Taiga period, ca. 2,500 yr. BP to modern, encompasses the disappearance of microblade technology from the archaeological record. It is also during this period that we see the beginning of the Athabaskan tradition in Alaska, which leads the technology shift outlined above and to ethnically recognizable Athabaskan groups.

This combination of chronological, environmental and cultural criteria provides flexibility that is lacking in more traditional chronologies, which are divided according to artifact types.

2.3 Archaeology

Twenty-four archaeological investigations have been conducted on DTA since 1963, identifying approximately 380 sites to date (Table 1). Twenty of these sites comprise the Donnelly Ridge Archaeological District, which is within DTA East. The majority of the archaeological surveys conducted in DTA have been limited to DTA East, which comprises 25 percent of the entire Donnelly Training Area.

Frederick West conducted the first regional survey of the Alaska Range foothills in the 1960s (West 1967). His survey at DTA included the Donnelly and Delta moraine physiographical areas. West located the 12 sites that comprise the Donnelly Ridge Archaeological District. This collection of sites has played a significant role in defining the Denali Complex of the American Paleoarctic Tradition.

In 1978, a reconnaissance-level survey was conducted in various areas of Fort Greely and DTA, resulting in the discovery of 62 sites (Holmes 1979). A 1979 survey located four sites (Bacon and Holmes 1980). Northern Land Use Research, Inc. conducted limited archaeological surveys in various areas of DTA during the summer of 1998, resulting in the identification of 16 additional sites (Higgs et al. 1999). Other smaller surveys have also been conducted for specific project areas. All of the sites that have been identified have been located in one of three physiographic settings: high points, bluffs or terraces overlooking a major river or site drainage, or lake margins. There is an inherent bias in these findings, however, as archaeological investigations have frequently focused on high probability settings such as these.

USARAK began archaeological surveys of large blocks of land within DTA East in 2002 to address proposed infrastructure construction on DTA East. Unlike previous surveys, these provided 100 percent pedestrian coverage of areas under consideration and an aggressive sub-surface testing strategy. These surveys (conducted 2002-2005) covered 53,500 acres and identified over 265 new sites of which approximately 91 have been evaluated for eligibility for listing in the NRHP. This includes one site that may be from the Athabascan Tradition or Early Contact period, which has been determined eligible for the NRHP, and one historic era site

(possibly relating to Transportation and Infrastructure) that has not yet been evaluated for eligibility.

The lands within DTA have likely supported human populations for 10,000 to 12,000 years. Because it was ice-free during the Wisconsin glaciation, interior Alaska contains the oldest verifiable prehistoric remains in the state and is significant in understanding the peopling of the New World. The oldest radiocarbon date for any item found on DTA is 8,555 (± 380) years BP, from charcoal at site XMH-00297. Some undated material resembles artifacts dating back to 12,000 BP.

Table 1. Archaeological survey of DTA East [1]

Year	Researcher	Survey Location	Result
1963-64	West	Various locations on DTA	25 archaeological sites found
1977	Rabich and Reger	XMH-00253	1 site investigated
1979	Bacon	XM-1 Tank Range	No archaeological sites found
1979 [2]	Holmes	Various locations on DTA	62 archaeological sites found
1979 [2]	Bacon and Holmes	Various locations on DTA	6 archaeological sites found
1980a	Steele	Bison Trail DTA East	3 archaeological sites found
1980b	Steele	Squad Assault Range DTA East	No archaeological sites found
1980	Bacon	Cantonment	No archaeological sites found
1982	Steele	Various locations on DTA	No archaeological sites found
1982	Steele	Donnelly Dome Quarry Site	No archaeological sites found
1983	Steele	Texas Range Powerline	1 archaeological site found
1985	Kotani	XMH-00297	1 site investigated
1988	Reynolds	Donnelly Dome WACS	1 archaeological site found
1992	Staley	Various locations on DTA	No archaeological sites found

1995 [2]	Gamza	Sullivan's Roadhouse	1 site investigated
1998 [2]	Higgs et al.	Various locations on DTA	16 archaeological sites found
2002	Goodman	Powerline on DTA East	No archaeological sites found
2002	Hedman et al.	Texas Range, Donnelly DZ, Eddy DZ	110 archaeological sites found [3]
2003	Robertson et al.	Eddy DZ	104 archaeological sites found [3]
2004	Raymond-Yakoubian and Robertson	North Texas and Eddy DZ	10 archaeological sites found
2005	Robertson et al.	Texas Range, DTA Training Areas	39 archaeological sites found

[1] Less than 1 percent of the surveyed area represented in this table was conducted on DTA West.
[2] A portion of this survey was conducted on DTA West.
[3] Some of these sites represent previously reported sites whose locations were not well documented and which were relocated to obtain more accurate data.

3.0 Methodology

To further build baseline knowledge of the archaeological resources on Army lands in Alaska, and to meet Section 106 obligations, USAG-AK will pursue a comprehensive inventory strategy in 2005. This will result in an intensive, full-coverage survey of survey units. Unless the survey area is stratified, all accessible areas of each "area of potential effect" (APE) will be subjected to pedestrian survey and all high probability locations will be subjected to subsurface survey when practical. Areas that are considered inaccessible include high angle slopes (greater than 40 degrees) and wetlands. Pre-season reconnaissance and air photo analysis may be used to enhance the effectiveness of large tract surveys. This will result in the elimination of some low probability portions of the APE from pedestrian transect survey. Stratification of survey areas will be based on previous research, distribution of known sites and knowledge of the survey area terrain. Stratification will result from an understanding of the cultural resources that are expected to be encountered in the survey area and the demonstrated distribution of site types among high and low probability terrain. This methodology report documents justification for survey stratification and elimination of portions of the APE from field survey.

3.1 Pedestrian Survey Methods

All areas not eliminated by pre-survey reconnaissance or classified as wetlands or steep slopes will be surveyed. Areas will be surveyed using a transect interval of no more than 20 meters. Transect intervals will decrease in areas of dense vegetation to insure a visual inspection of the entire survey area. Transect intervals will also decrease in areas deemed to have a high potential for containing archaeological sites. Transect intervals below the 20 meter minimum will be decided in the field by the field crew leader in consultation with the appropriate Post Archaeologist. Transect survey units will be partitioned according to existing roads and trails where possible. When roads do not provide for practical unit boundaries, a one square kilometer work unit will be used.

All areas of high potential for subsurface material will be systematically shovel tested. There will be approximately 20 meters between tests and test intervals may be closer. An example of an area that may be tested in 20 meter intervals is a long ridgeline or large landform that offers a number of undifferentiated high probability locations. A shorter test interval will be used to test small, isolated, high probability landforms such as an isolated knoll, prominence with a view, lakeside terraces, stream mouths, or level benches adjacent to steeper slopes (this list is not complete and is meant as an example of locations that may be tested intensively). Shovel tests will be square or round and measure at least 30cm in diameter and will be excavated to the maximum depth possible. All soil removed will be screened through ¼ inch hardware cloth. The number of tests and approximate location of testing will be recorded by crew leaders. If deep testing is warranted, bucket auger testing will be initiated following the same placement and recording protocols. Oakfield soil probes will be used when necessary to identify sites and features or to delineate site boundaries.

Crew leaders will use GPS, topographic maps and air photos to record field data. All spatial data will be entered into GIS data files. Crewmembers will record their activities in field notebooks. Data recorded daily will include date, crew names, crew leader name, activity (e.g. survey, shovel testing, site sampling) and details of crew and individual tasks and activities. Recordation of incidental observations regarding weather conditions, technical problems, task efficiency, and task and project coordination will also be encouraged.

3.1.1 High and Low Probability Locations

Surveys carried out by USAG-AK archaeologists at DTA East in 2002 and 2003 (Hedmen et al. 2003 and Robertson et al. 2004) indicate that important environmental aspects contributing to site placement include the view shed, elevation relative to the immediately surrounding terrain, and distance to water. Lake margins and the tops of small knolls and ridgelines provide the highest probability locations for archaeological sites. Elevated portions of clear streams and anadromous fish streams, stream confluences and islands are also considered high probability locations. Other high probability locations include benches adjacent to steeper slopes and leading edges of terraces.

Low probability terrain on DTA lands includes flat expanses of spruce forest that lack water, wetlands and slopes greater than 40 degrees. Full coverage surveys have failed to locate any archaeological sites in these settings.

3.2. Site Criteria

3.2.1 Prehistoric Site Designation

The minimum required for designation of a prehistoric archaeological site will be the presence of a single artifact on the ground surface, a single positive shovel test, or a single identifiable feature such as a house depression, cache pit, or hearth. "Sites" defined on the basis of sub-surface finds will minimally include a single identifiable artifact or feature such as a flake, manuport, or hearth. Site boundaries will be determined during the evaluation phase.

Once a site has been identified, a USAG-AK site form will be filled out, a sketch map will be drawn using compass and tape, and an aluminum survey cap will be installed. Survey caps will be placed on a length of rebar and inserted so that approximately 5cm extends above the ground surface. Survey caps will be stamped with the site's AHRS number. If time allows, site boundaries will be determined during the site identification phase (see "Site Evaluation Procedures").

3.2.2 Historic Site Designation

Historic archaeological sites are those sites that are greater than 50 years of age that reflect historic period activities and could not otherwise be designated as a prehistoric site. Most standing structures that are attributable to the military use of these lands will lie beyond the purview of archaeological inventory. USAG-AK lands contain several property types that are in excess of 50 years of age. Examples include homesteads and mining remains, trap line cabins and guide cabins, aircraft wrecks, roadhouse remains, early trails and early communication systems. Any property deemed in excess of 50 years in age will be documented as a site in the manner prescribed in this methodology.

3.6 Artifact Collection

Artifact collection will be limited to artifacts retrieved from shovel tests, important diagnostic artifacts found on the surface, and artifacts that are in immediate danger of destruction. All artifacts collected will be recorded on a site map. Artifacts collected will be bagged and labeled in accordance with USAG-AK and University of Alaska Museum standards.

3.7 Threatened Resources

In the case of cultural material being in immediate danger of destruction, USAG-AK's Cultural Resource Manager will be notified. Appropriate mitigation measures will be determined in

consultation with the Alaska State Historic Preservation Officer and interested Tribal Governments.

3.8 Human Remains

Any human remains, sacred objects, funerary objects, or objects of cultural patrimony that are encountered will be avoided. Work will stop in the immediate vicinity of the find, measures will be taken to protect remains, and the Cultural Resource Manager will be notified immediately so that appropriate action can be taken.

4.0 NRHP Eligibility Evaluations

4.1 Archaeological Sites

The site Evaluation Phase will occur once the entire APE has been inventoried. This phase will focus on evaluating identified sites for eligibility for inclusion in the National Register of Historic Places.

As site testing is inherently destructive, the minimum amount of testing necessary to make eligibility determinations will be undertaken. Evaluations will include the minimum number of shovel tests necessary to determine the aerial and sub-surface extent, site integrity and the nature of the information the site may yield. Shovel tests will follow the standard dimensions outlined previously and will be excavated and recorded in a manner that allows for determining the depth of cultural material, thickness of deposits and the location of cultural material concentrations across the site. Evaluation Phase shovel testing will be recorded on USAG-AK shovel test forms (see Appendix). All excavated soil will be screened through ¼ inch hardware cloth. All sub-surface testing will be mapped with compass and tape. Location of positive tests and site boundaries will be clearly indicated on both a USGS 1:63,360 and a DMA 1:50,000 map as well as on a site sketch map. All test excavations will use 10cm arbitrary levels unless clear stratigraphy dictates otherwise. Each level will be recorded on USAG-AK excavation level forms. These forms, along with the USAG-AK photo log, provide for complete documentation of plan drawings, profile drawings, level photographs, soil level descriptions, artifact descriptions and feature descriptions. Artifact collection, care, and labeling will be performed to USAG-AK standards. Artifacts will be curated at the University of Alaska Museum, under an existing Memorandum of Understanding (MOU).

4.2 Determinations of Eligibility

As many of the recorded sites on USAG-AK lands are small, shallow lithic scatters and discrete surface scatters, evaluation may only require shovel testing and a thorough examination of the ground surface to determine eligibility. Typically, the most important factor in evaluating eligibility for these types of sites is how well the site satisfies Criterion D of the National Register Criteria for Evaluation (research potential). As such, integrity of the site is very important. Even very small sites and sites lacking datable material are very important for understanding Interior Alaskan prehistory and local site formation processes. In cases where site integrity is difficult to assess, 1m x1m test units will be excavated strategically across the site to determine the extent of any site disturbance and the presence, location and densities of buried cultural material. Once the cultural deposit has been characterized and the integrity has been assessed, a determination of whether the site contains information that can significantly contribute to important research questions will be addressed.

Results of the Evaluation Phase work at each site will be presented in a formal Determination of Eligibility report. These reports will be submitted to the Alaska State Historic Preservation Officer for review and concurrence and then distributed among interested parties. These reports will contain a complete description of the evaluation methodology, site characteristics, level of integrity and discussion of the research potential of the site. Reports will include all pertinent maps, photos and tables.